Risk, Return, and Ross Recovery

The risk return relation is a staple of modern finance. When risk is measured by volatility, it is well known that option prices convey risk. In a parametric Markovian setting, risk-neutral transition probabilities can also be determined from option prices. Recently, Ross has shown that real-world transition probabilities of a Markovian state variable can be recovered from its risk-neutral transition probabilities along with a restriction on preferences. In this paper, we show how to recover real-world transition probabilities in a diffusion context in a preference-free manner. Our approach is instead based on restricting the form and dynamics of the numeraire portfolio. (Joint work with Jiming Yu.)

Biography

Dr. Peter Carr is a Managing Director at Morgan Stanley with 15 years of experience in the derivatives industry. He was also a finance professor for 8 years at Cornell University, after obtaining his PhD from UCLA in 1989. He is presently the Executive Director of the Math Finance program at NYU's Courant Institute, the Treasurer of the Bachelier Finance Society, and a trustee for the Museum of Mathematics in New York. He has over 70 publications in academic and industry-oriented journals and serves as an associate editor for 8 journals related to mathematical finance. He was selected as Quant of the Year by Risk Magazine in 2003 and shared in the ISA Medal for Science in 2008. The International Association of Financial Engineers (IAFE) and Sungard selected Dr. Carr as its 2010 Financial Engineer of the Year.